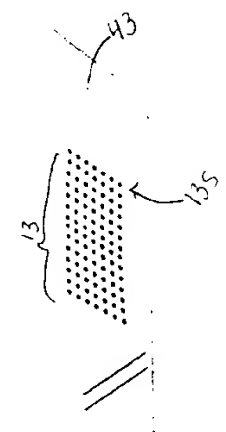


FIG. 1A

Validation - phase I

- verification of initial ---
- screening results

- establish cellular -----
- localization & anatomic
- distribution

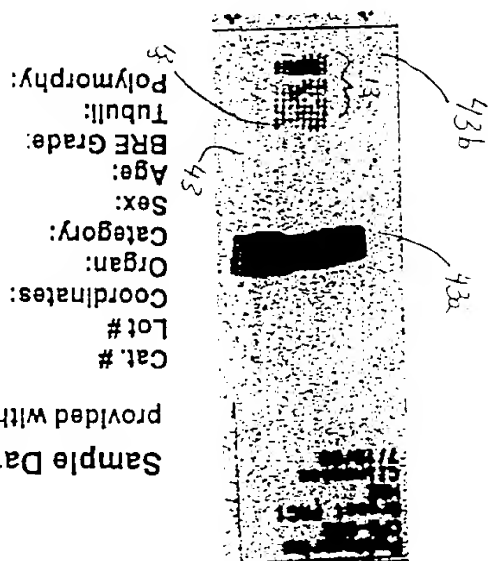


50-200
series basic
arrays

FIG. 1B

FIG 2E

#16-2D



Cat.#	BR50
Lot #	07
Coordinates:	A1a
Organ:	Breast
Category:	Breast cancer; ductal
Sex:	F
Age:	67
BRE Grade:	G2
Tubull:	3
Polyomorphy:	3
Mitoses:	1
PT:	1
PN:	0
LN pos	0
LN all	23
Tumor dia.	15
Surgery:	mastectom

Sample Data Sheet information (for one tissue element, located at A1a) provided with every pathWorks™ Tissue MicroArray

FIG. 2C

Six tissue elements from a PathWork™ Breast Array BR50 stained with CK7 showing selective staining (400X). Tissue elements are 0.6mm in diameter and spaced 0.3mm apart.



Fig. 2B

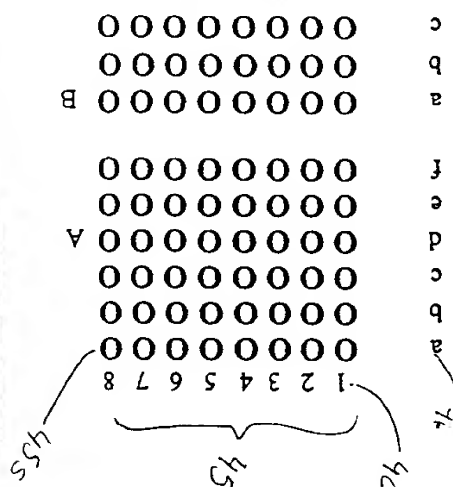
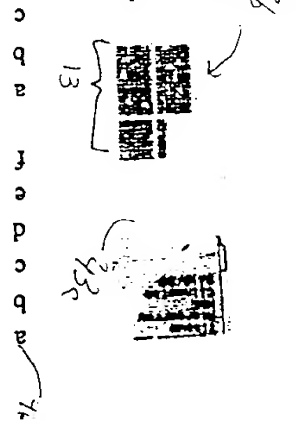
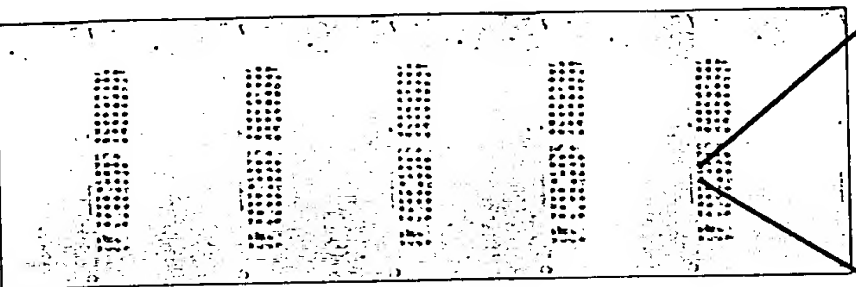
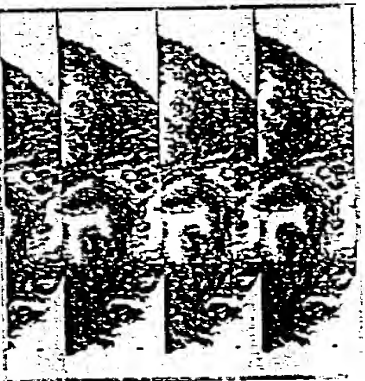


FIG. 2A



Tissue MicroArrays



- Development of population databases
- High-throughput in situ analysis of DNA, RNA and protein
- Discovery of diagnostic and prognostic correlations
- Target prioritization

The Clinomics Biorepository

Clinomics Biorepository Application - (ItemSpecimenEntry: Form)

File Edit View Insert Format Records Tools Window Help

Standard toolbar icons: New, Open, Save, Print, Find, etc.

Window control buttons: Minimize, Maximize, Close

Specimen Entry Form

Pathology # Lookup Pathology # H-983-90

Patient Data | Diagnosis | Histology | Specimen Data

Collection Date	Age at Collection	Received Date	Received Tech	Specimen Type	Amount
6/19/1990	83	10/15/1990	CU	Tissue	block
Medication	Can Medication	Metastasis Site	Biendence	Treatment	TNMStaging
CMF	Taxol	Lung	Biopsy	Chemotherapy	T1N1M1U
Chemotherapy	Chemo Date	Radiation Therapy	Radiation Date	Node Status	Surgical Biopsy
Yes	8/20/1990	Yes	7/15/1990	Positive	Yes
Primary Site	Tubal Type	Surgical Resection			
Breast (I)	Conical	Yes			

Add New Pathology
Delete Existing Pathology
Save Record

Clinomic ID	Description	Location	Sample Type	Amount	Quota #
000002841		TPA, A, tubes	FFPE	block	0
000007489	Breast cancer	TPA, A, tubes	S	100 mg/l	0
000007491	Breast cancer	TPA, B, bags	FFPE	100 Mg	0
000007492	Breast cancer	TPA, B, bags	FFPE	100 mg	0
000007493	Breast cancer	TPA, A, tubes	FFPE	100 mg	0
000007494	Breast cancer	TPA, A, tubes	FFPE	100 mg	0

Sample Data

Record: 14 of 4771

Form View

Start | American | CD Pa... | HP 69... | Clinom...

4:18 PM

CLINOMICS

FIG. 4A

Biorepository Database

coordinates	array	histology	BR	grade	tumor diameter	pT	pN	nodes examined	nodes pos	censor	months survival	age	hormotherapy	chemotherapy	prophylactic mastectomy
		ductal		1						0	58	33			
		invasive		1		90	3	1	40	28	0	78	43	no	yes
		ductal		2		60	3	2	10	6	0	29	54	yes	no
		ductal		1		20	1	0	8	0	0	96	55	no	no
		ductal		1		30	4	1	9	2	0	64	70	yes	no
		ductal		1		30	4	1	14	8	0	43	44	no	yes
		ductal		1		10	1	1	11	2	0	12	51		no
		ductal		3		22	2	1	16	3	0	107	64	yes	no
		ductal		3		30	2	3	4	4	0	21	48		
		ductal		3				2			0	28	49		
		ductal		2		40	2	1	13	5	0	55	69		
		ductal		1		40	2	2	12	9	0	73	44		
		ductal		2		30	4	2	10	7	0	85	70		
		ductal		3		30	4	0	14	0	0	80	79	no	no

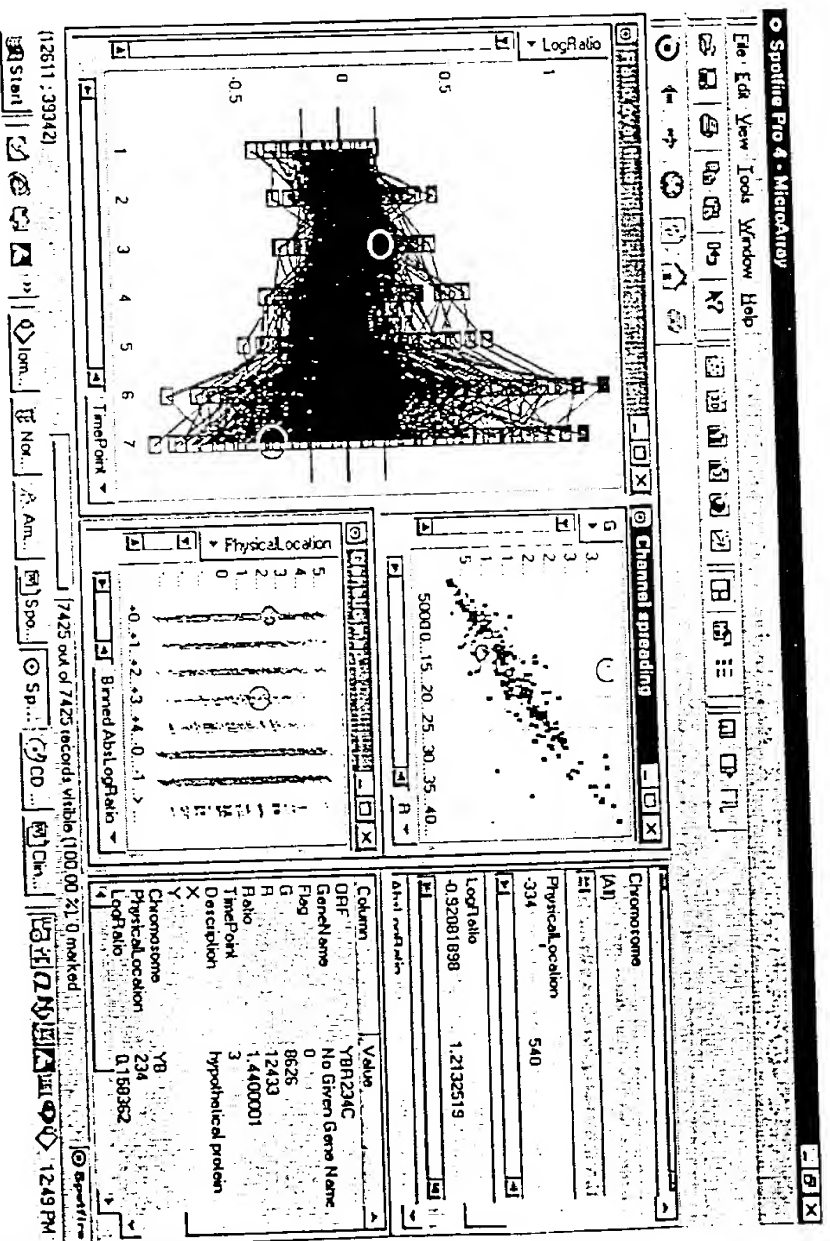
Medication and treatment histories, with outcomes, and expression profiles

FIG. 4B

CLINOMICS

Biorepository Database

- Sorting and selection of patient populations
- Clustering analysis
- Development of expression profiles vs. medical data



Clustering analysis

FIG. 4C

CLINOMICS

FIGURE 5

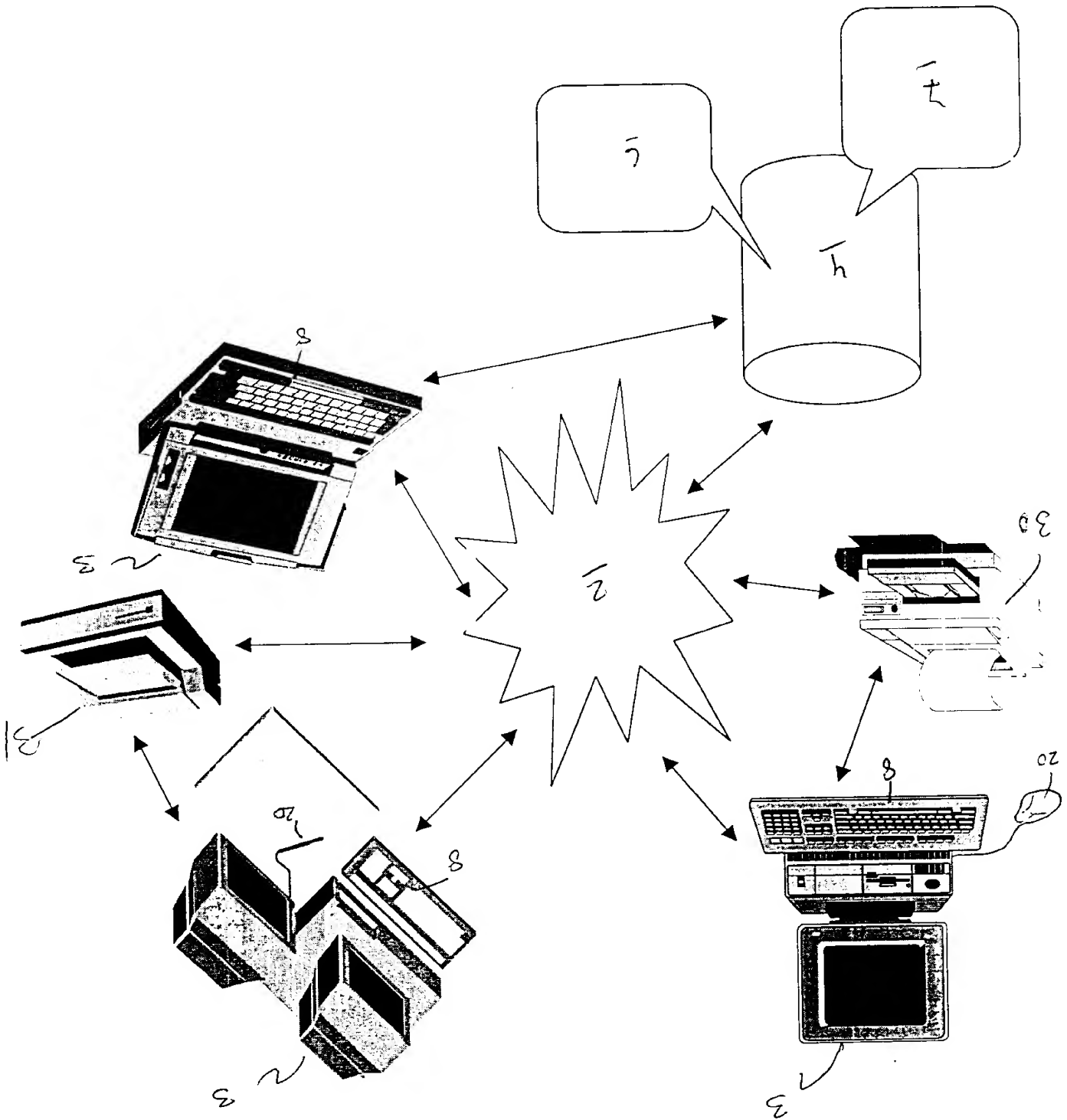
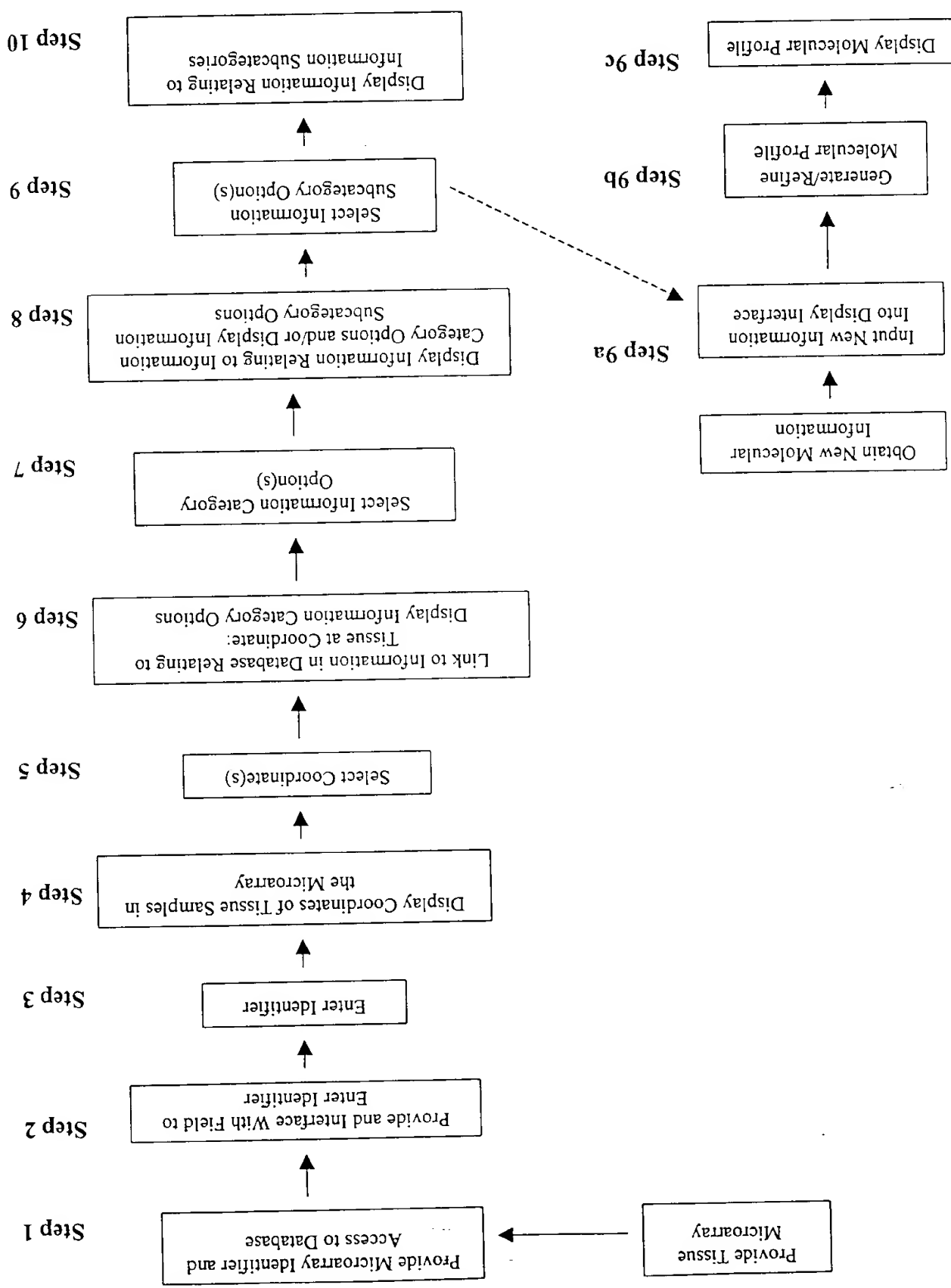


FIG. 6



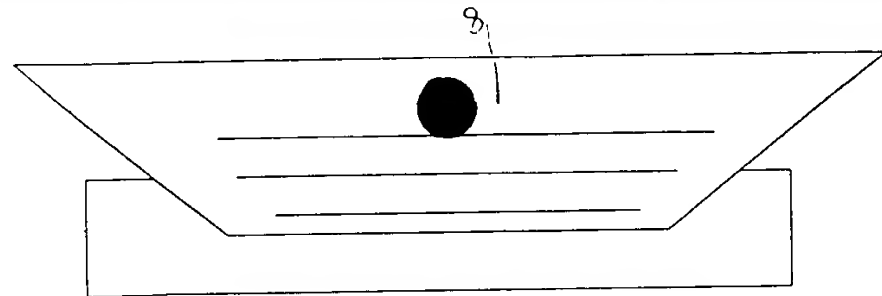


FIG. 7D

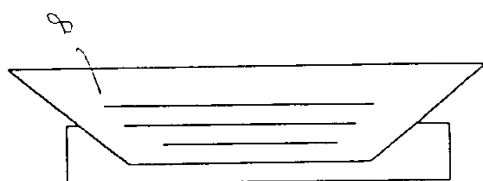


FIG. 7E

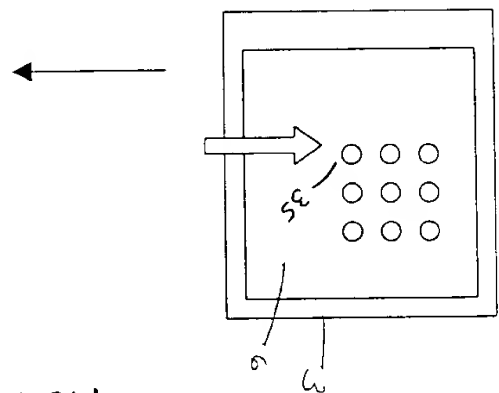
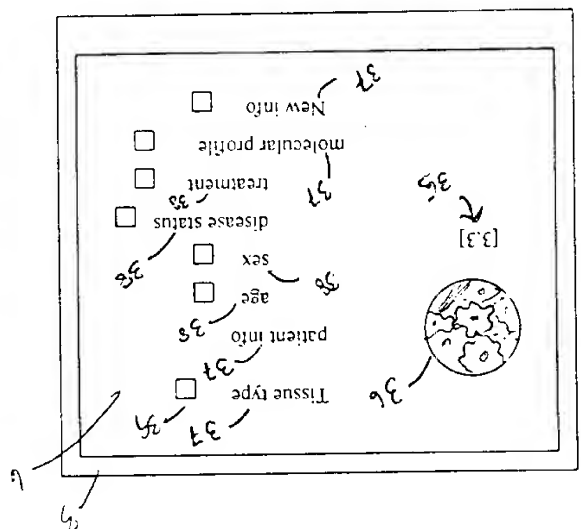


FIG. 7G

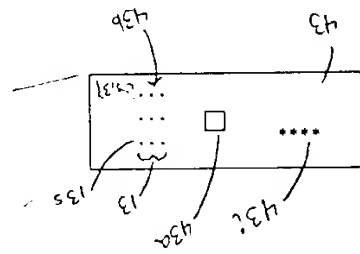
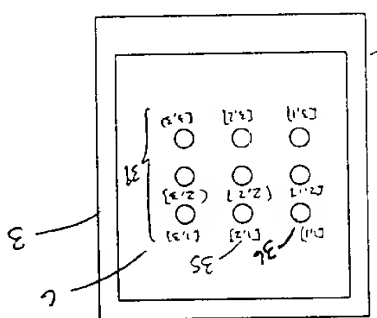


FIG. 7A

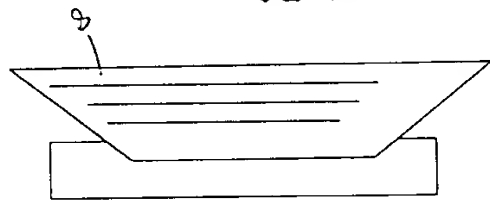
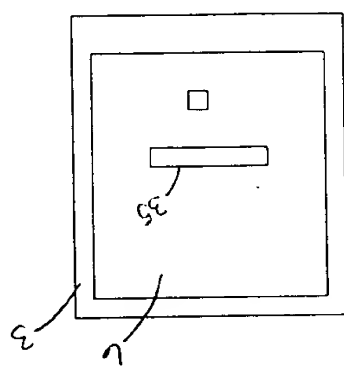
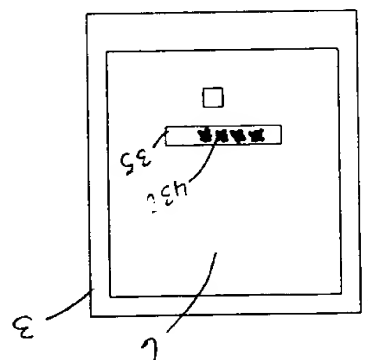
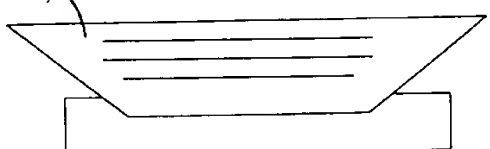


FIG. 7B



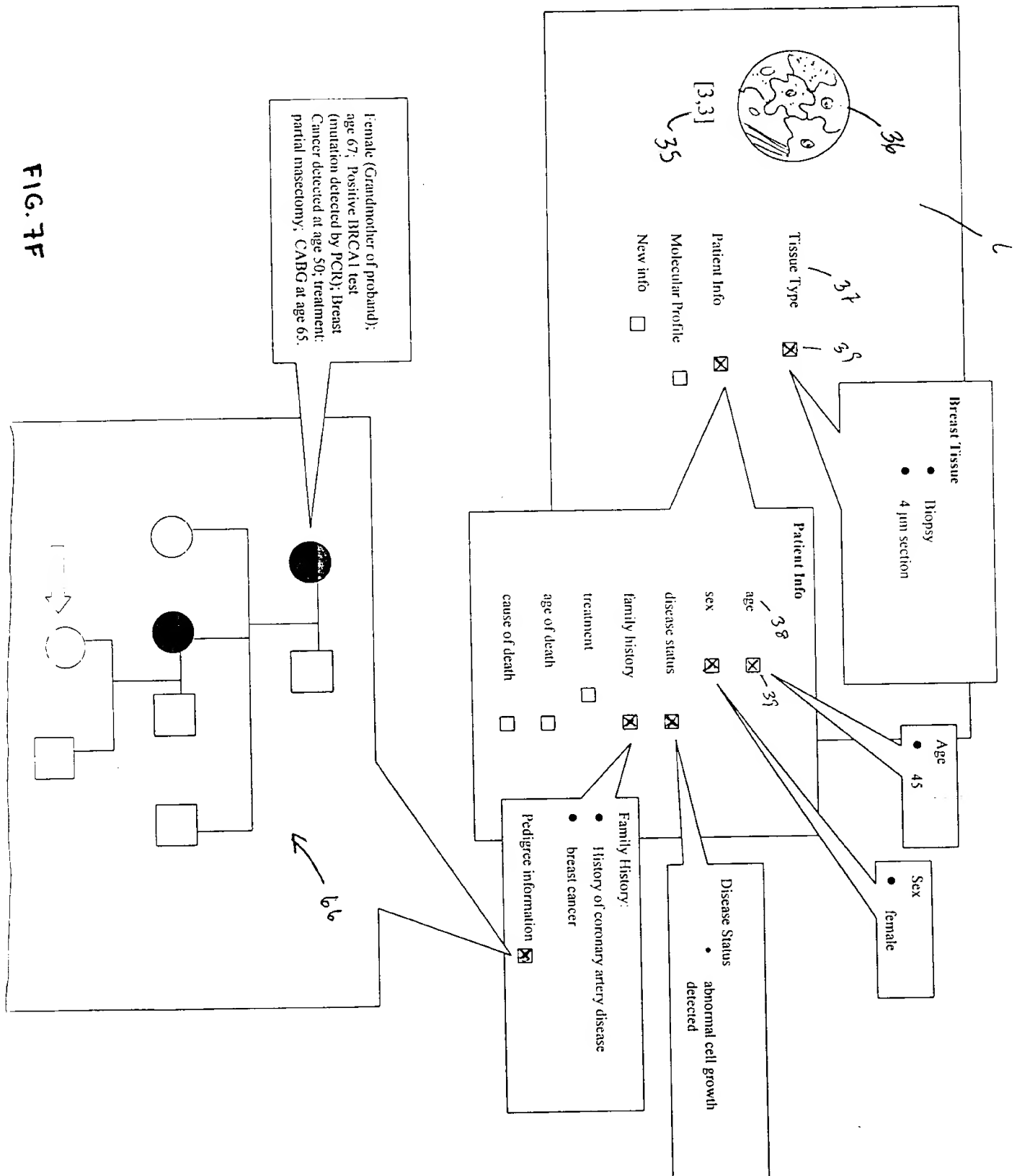


FIG. 7F

FIG. 76

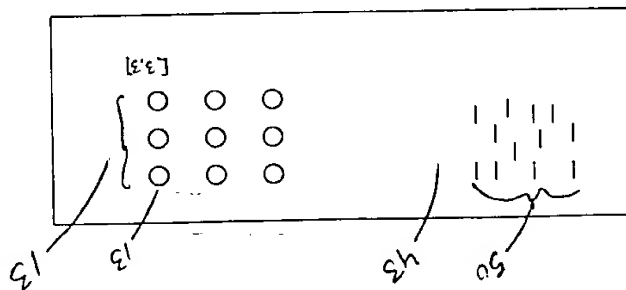
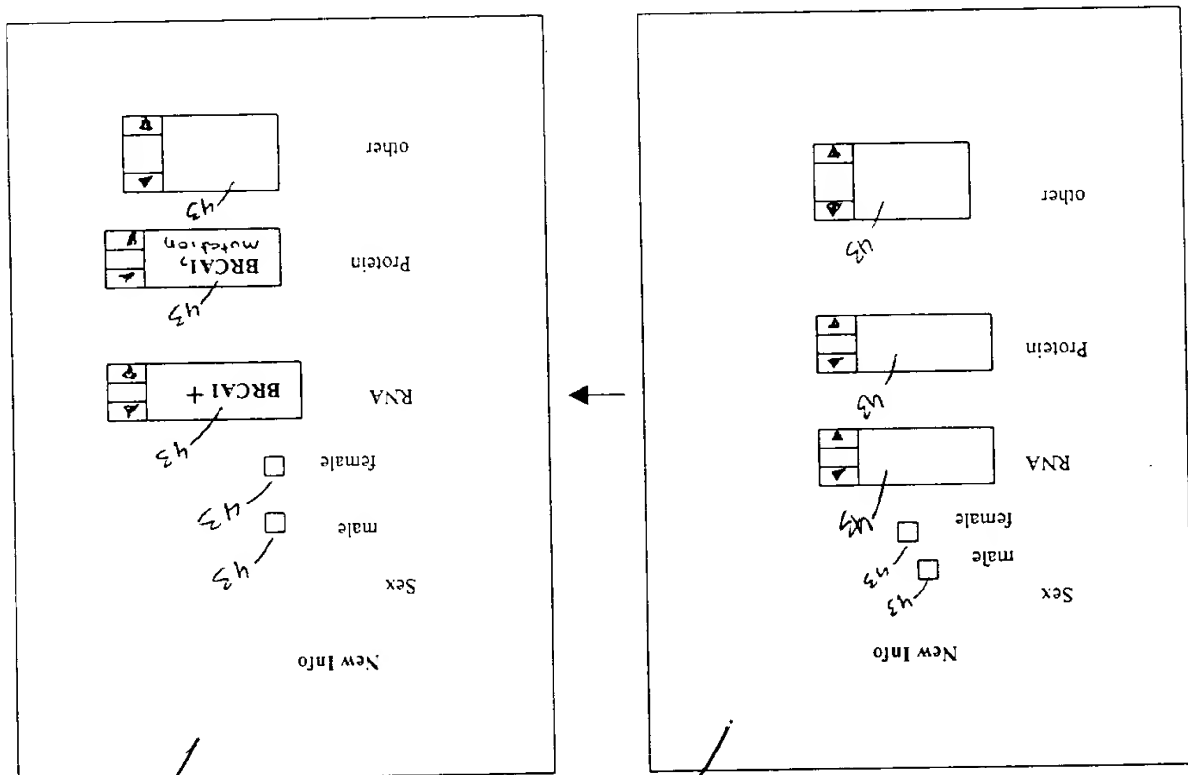


FIGURE 8

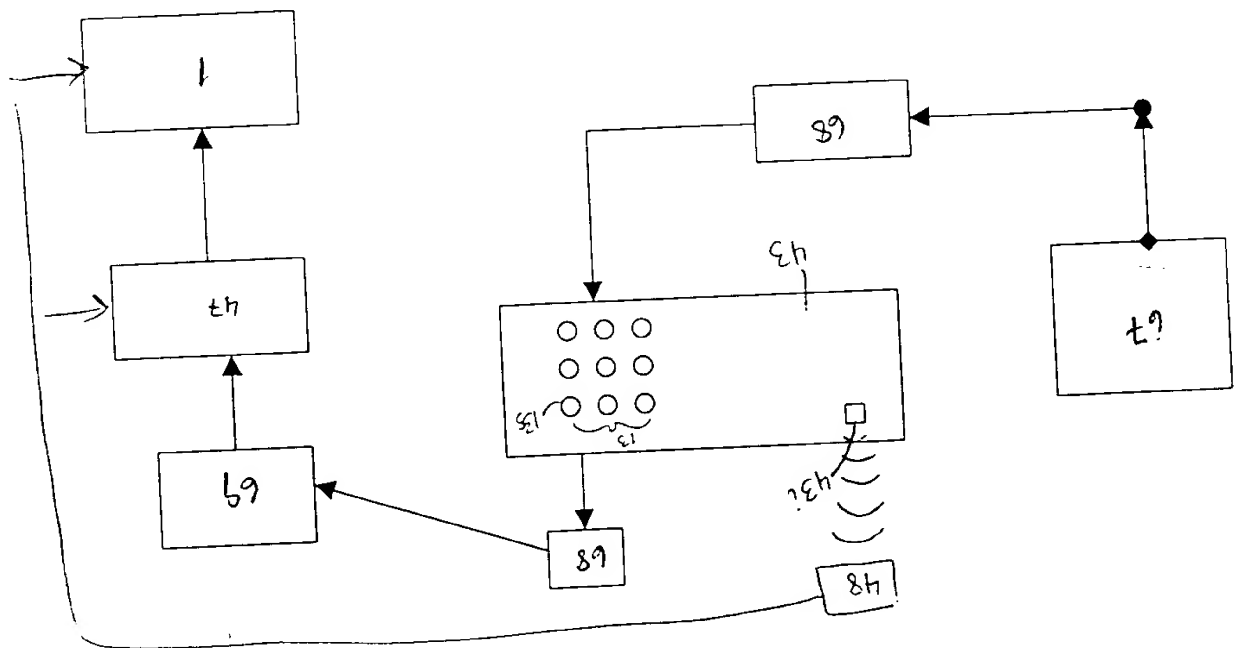
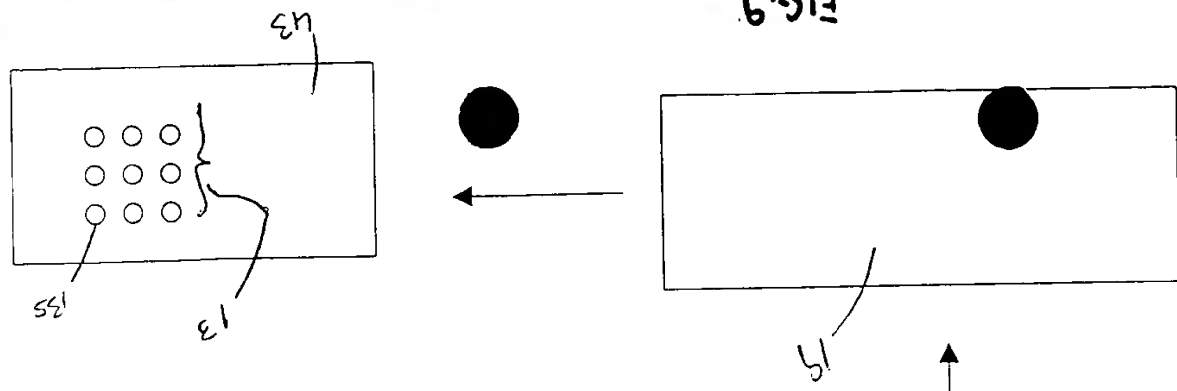


FIG. 9



NAME >
TITLE >
COMPANY_NAME >
STREET_ADDRESS >
STATE_OR_PROVINCE >
POSTAL_CODE >
Method of Payment
Account No.
Title of Microarray
Delivery Date:

Billing Information

- ☐ skin
- ☐ trachea
- ☐ tongue
- ☐ eyes
- ☐ testes
- ☐ ovaries
- ☐ prostate
- ☐ urethra
- ☐ ureter
- ☐ kidney
- ☐ colon
- ☐ stomach
- ☐ pancreas
- ☐ spleen
- ☐ liver
- ☐ heart
- ☐ lung
- ☒ brain

Order Form

Cerebellum ☒ medulla ☒ cortex ☒
normal ☒ cancer ☒ Parkinson's disease ☐ Canavan's disease ☐ ALS ☐

71

72

70

18

12

19

FIGURE 10

Microsoft Access - [Pathology H-0717-86 to H-0065-87]

File Edit View Insert Format Records Tools Window Help

Pathology # H-0722-86

Clinomics ID 000000006P

Age/D08 63

Sex M

Collection Date 4/30/86

Location tissue processing area

Primary Site Bladder

Medication Con Medication

Metastasis Site hydrochlorothiazide

Evidence Valium, Tylenol

Grade 2

Surgical Resection Bladder

TNM Staging T2N0M0

Surgical Biopsy CA-15-3

Progesterone NA

Estrogen NA

Save Record

Primary Diagnosis grade 2 papillary transitional cell carcinoma showing at least superficial smooth muscle invasion and associated with mildly atypical

Amount block

Treatment Chemotherapy, R.

Node Status No Positive Node

Radiation Therapy Localized Radiation Therapy, Pelvic

CEA NA

Chemotherapy and Methotrexate and 5FU

Sample Type paraffin

Pathology ID of 31393

Record: 14 of 6

Form View

100

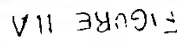
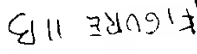
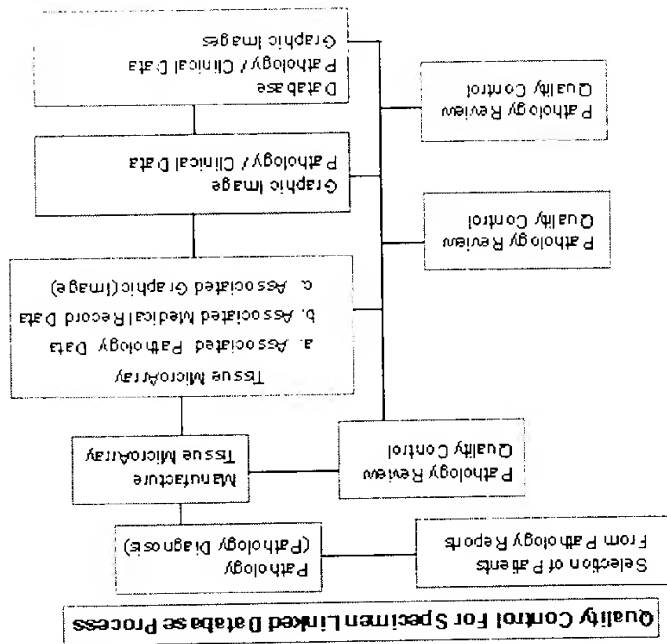


FIGURE 12



SNO-MED ANASITE NUMBERS							
1.02	SKIN	1.41	ARTERY, GENERAL	1.77	PROSTATE	1.71	TRUNK, PERINEUM
1.03	SUBCUTANEOUS TISSUE	1.42	AORTA	1.78	TESTES, TUNICA VAGINALIS	1.72	THORACIC DIAPHRAGM
1.04	BREAST	1.43	CORONARY ARTERY	1.79	SCROTUM, SPERM CORD	1.73	THORACIC VISCERA
1.06	BONE MARROW	1.44	PULM. ARTERY	1.80	VULVA, LABIUM, CLITORIS	1.76	RETROPERITONEUM
1.07	SPLEEN	1.45	VERT. CAROTID, CEREBR. TEMPOR.	1.81	VAGINA, HYMEN	1.71	SYNOVIAL FLUID
1.08	LYMPH NODES	1.46	ILIAC, RENAL, MESENTERIC ARTERY	1.82	UTERUS	1.22	UPPER RESP. FLDS
1.09	LYMPHATICS	1.47	POPILITEAL ARTERY	1.83	CERVIX	1.6X	GI FLDS, SPACES
1.11	BONE	1.48	VEIN	1.84	ENDOMETRIUM	1.6Y	GI CONTENTS
1.12	SYNOVIAL JOINT	1.49	VEIN	1.85	MYOMETRIUM	1.7X	URINE TRA. FLD. SPACE
1.13	MUSCLE	1.50	DIGESTIVE SYSTEM	1.86	FALLOPIAN TUBE	1.7Y	MALE GENT. FLD. SPACE
1.15	CARTILADGE	1.51	MOUTH, PALATE, ORAL	1.87	OVARY	1.8X	FEM. GENT. FLD. SPACE
1.16	BURSA	1.52	LIP	1.88	PLACENTA, UMBILICORD	1.8Y	PLACENTA, FETAL FLD
1.17	TENDON	1.53	TONGUE	1.89	FETUS	1.9X	NERVOUS SYSTEM
1.18	LIGAMENT, FASCIA	1.54	GUM, TOOTH, GINGIVA	1.91	PITUITARY	1.9Y	BODY AS A WHOLE
1.19	SOFT TISSUE	1.55	PAROTID, SALIV. GLND	1.93	ADRENAL		
1.21	NOSE	1.56	LIVER	1.96	THYROID		
1.22	SINUS, ACCESSORY	1.57	GALLBLADDER	1.97	PARATHYROID		
1.23	NASOPHARYNX	1.58	EXTRAHEPATIC BILE DUCT	1.98	THYMUS		
1.24	VOC. CORD, LARY. EPIGLT	1.59	PANCREAS	1.99	ISLET OF LANGERHANS		
1.25	TRACHEA	1.60	PHARYNX	1.9X	BLOOD		
1.26	BRONCHUS	1.61	TONSIL, ADENOIDS	1.1X	FIBRO. ADIPOSE TISSUE		
1.27	BRONCHIOLE	1.62	ESOPHAGUS	1.18	UPPER EXTREM.		
1.28	LUNG	1.63	CEMENTUM, STOMACH, PYLORUS	1.19	LOWER EXTREM.		
1.29	PLEURA	1.64	SM. INTEST., DUODENUM	1.1X	EYE		
1.30	CARDIO VAS. SYS	1.65	JEJUNUM, ILEUM	1.1X	APPENDIX		
1.31	PERICARDIUM	1.66	APPENDIX	1.32	HEART		
1.33	MYOCARDIUM	1.68	RECTUM	1.33	BASAL GANGLIA		
1.34	ENDOCARDIUM	1.69	ANUS	1.34	THALAMUS		
1.35	CARDIAC VALVE	1.71	KIDNEY	1.35	PONS, MIDBRAIN		
1.36	TRICUSPID VALVE	1.72	PENAL PELVIS, COCCYX	1.36	CEREBELLUM		
1.37	PULMONIC VALVE	1.73	URETER	1.37	SPINAL CORD		
1.38	MITRIAL VALVE	1.74	BLADDER	1.38	CRANIAL NERVE, OPTIC		
1.39	AORTIC VALVE	1.75	URETHRA	1.39	NERVE, VAGUS NERVE		
1.40	BLOOD VESSELS	1.76	PENIS	1.40	SCALP, ORBITAL		

FIGURE 14A

SNO-MED DIAGNOSIS NUMBERS CARCINOM	
M 8143	ADENOCARCINOMA
M 8233	ADENOCARCINOMA, ANAPLASTIC
M 8313	ADENOCARCINOMA, CLEAR CELL
M 8483	ADENOCARCINOMA, COLLOID
M 8443	ADENOCARCINOMA, CYSTIC
M 8563	ADENOSQUAMOUS CARCINOMA
M 8142	ADENOCARCINOMA, IN-SITU
M 8473	ADENOCARCINOMA, MUCINOUS CYST
M 8263	ADENOCARCINOMA, PAPILLARY
M 8233	ADENOCARCINOMA, UNDIFFER
M 8493	ADENOCARCINOMA, SIGNET RING
M 8630	ARRHENBLASTOMA
M 8003	ANAPLASTIC MALIGNANCY
M 9403	ASTROCYTOMA, GRADE 1
M 9433	ASTROCYTOMA, GRADE 2
M 9443	ASTROCYTOMA, GRADE 3 & 4
M 8393	ADNEXAL CARCINOMA
M 8023	ANAPLASTIC CARCINOMA
M 8203	ADENOID CYSTIC CARCINOMA
M 9310	ADAMANTINOMA
M 8253	ALVEOLAR CARCINOMA
M 8001	ACINAR TUMOR
M 8553	ACINAR CARCINOMA
M 8093	BASAL CELL CARCINOMA
M 8253	BRONCHIOLAR CARCINOMA
M 8123	BASALOID TRANSITIONAL CARCINOMA
M 8090	BASAL CELL EPITHELIOMA
M 8013	CARCINOMA
M 8483	CARCINOMA, COLLOID
M 8012	CARCINOMA, IN-SITU
M 8053	CARCINOMA, PAPILLARY
M 8043	CARCINOMA, SMALL CELL
M 8983	CARCINOSARCOMA
M 8243	CARCINOID, MALIGNANT TUMOR
M 8023	CARCINOMA, UNDIFFERENTIATED METS
M 8023	CARCINOMA, UNDIFFERENTIATED
M 9103	CHORIOCARCINOMA
M 8241	CARCINOID TUMOR
M 8163	CHOLANGIOCARCINOMA
M 9223	CHONDROSARCOMA
M 9230	CHONDROBLASTOMA
M 9351	CRANIOPHARYNGIOMA
M 8203	CYLINDROMA
M 8463	CYSTADENOCARCINOMA PAPILLARY SEROUS
M 8453	CYSTADENOCARCINOMA, PAPILLARY
M 8823	DERMATOFIBROSARCOMA
M 7600	DYSPLASIA
M 8503	DUCTAL, INFILTRATING CARCINOMA
M 9391	EPENDYMOMA

FIGURE 14B

M.8073	EPIDERMOID CARCINOMA
M.9073	EMBRYONAL CELL CARCINOMA
M.8110	EPITHELIOMA
M.9263	EWINGS SARCOMA
M.8823	FIBROSARCOMA
M.8333	FOLLICULAR CARCINOMA
M.8803	GIANT CELL SARCOMA
M.9040	GIANT CELL TUMOR
M.8621	GRANULOSA CELL TUMOR
M.9443	GLIOBLASTOMA, MULTIFORME
M.9383	GLIOMA
M.8033	GIANT CELL CARCINOMA
M.9161	HEMANGIOBLASTOMA
M.8973	HEPATOBLASTOMA
M.8830	HISTOCYTOMA
M.9653	HODGKINS
M.9683	HODGKINS SARCOMA
M.8363	HURTLER CELL CARCINOMA
M.8153	ISLET CELL CARCINOMA
M.9143	KAPOSI SARCOMA
M.9865	LEUKEMIA, ACUTE MYELOGENOUS
M.9826	LEUKEMIA, LYMPHOMA
M.9807	LEUKEMIA
M.9827	LEUKEMIA, CHRONIC LYMPHOMA
M.8893	LEIOMYOSARCOMA
M.9633	LYMPHOMA, LYMPHOCTIC
M.9593	LYMPHOMA, LYMPHOCTIC
M.9693	LYMPHOMA, GIANT FOLLICULAR
M.9623	LYMPHOMA, LYMPHOCTIC
M.9593	LYMPHOMA, MALIGNANT
M.9643	LYMPHOMA, HISTIOCYTIC
M.8083	LYMPHEPITHELIOMA
M.9703	LYMPHOMA, T-CELL
M.9613	LYMPHOSARCOMA, LYMPHOCTIC
M.8853	LIPOSARCOMA
M.9603	LYMPHOMA, STEM CELL
M.8773	MALIGNANT MELANOMA SPINDLE CELL
M.9530	MENINGIOMA
M.8016	METASTATIC CARCINOMA
M.8003	MALIGNANT TUMOR
M.8006	METASTATIC MALIGNANT TUMOR
M.9473	MEDULLOBLASTOMA
M.8723	MALIGNANT MELANOMA
M.6972	MALIGNANT CELLS
M.9370	MYOBLASTOMA
M.8433	MUCOEPIDERMOID CARCINOMA
M.8243	MALIGNANT CARCINOID TUMOR
M.8993	MALIGNANT MESENCHYOMA
M.9051	MESOTHELIOMA
M.9733	MELOMA
M.8733	METASTATIC MELANOMA

FIGURE 14C

M.8623	MALIGNANT GRANULOSA CELL TUMOR
M.8703	MALIGNANT PHEOCHROMOCYTOMA
M.9053	MALIGNANT MESOTHELIOMA
M.8893	METASTATIC LEIOMYOSARCOMA
M.8953	MESODERMAL TUMOR
M.8940	MIXED TUMOR
M.9503	NEUROBLASTOMA, NEUROEPITHELIOMA
M.5443	NECROTIC TUMOR
M.9503	NEUROBLASTOMA, NEUROEPITHELIOMA
M.9453	OLIGODENDROGLIOMA
M.8043	OAT CELL CARCINOMA
M.9200	OSTEOBLASTOMA
M.9180	OSTEOMA
M.9183	OSTEOSARCOMA
M.9190	OSTEOIDOSTEOMA
M.9210	OSTEOCHONDROMA
M.8053	PAPILLARY CARCINOMA
M.9733	PLASMA CELL MYELOMA
M.8463	PAPILLARY METASTATIC CYTADENOCARCINOMA
M.8133	PAPILLARY TRANSITIONAL CELL CARCINOMA
M.2485	RENAL CELL CARCINOMA
M.9643	RETICULUM CELL SARCOMA
M.8313	RENAL CLEAR CELL CARCINOMA
M.8073	SQUAMOUS CELL CARCINOMA
M.8316	SARCOMA, RETICULAR CELL
M.8070	SQUAMOUS EPITHELIAL TUMOR
M.8072	SQUAMOUS CELL CARCINOMA IN-SITU
M.8803	SARCOMA, UNDIFFERENTIATED GIANT CELL
M.9643	SARCOMA, RETICULAR CELL
M.8033	SPINDLE CELL CARCINOMA
M.9063	SEMINOMA
M.8933	STROMAL SARCOMA
M.8001	TUMOR
M.8043	TUMORLET
M.8583	THYROMA MALIGNANT
M.8123	TRANSITIONAL CELL CARCINOMA
M.9081	TERATOMA
M.8053	VERRUCOUS SQUAMOUS CARCINOMA

BRAIN INVENTORY CLASSIFICATIONS

1